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(54) Title: **LIGHT-INDUCED ELECTRON CAPTURE AT A SURFACE**

(57) Abstract: New conditions have been developed which increase the performance and usefulness of laser induced electron capture mass spectrometry (LI-EC-MS). Light from a light source, generally a laser, is used to activate an electron of a surface, preferably a metal surface, where the light energy is below the work function of the surface. The electron is transferred to an analyte on the surface, forming an anionic product from the analyte, where the anionic product can simultaneously undergo desorption for detection in a mass spectrometer. Alternatively, the analyte can receive an electron from an intermediate compound having a low ionization potential which is deposited on a surface along with the analyte. The new conditions not only give a sharper or more intense signal from an analyte than prior forms of LI-EC-MS, but utilize ordinary MS equipment. Further, the new procedure even enables detection of species, such as nucleic acids labeled with polyfluoro-containing groups, that previously were beyond the reach of LI-EC-MS techniques.

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